

ANOTHER CASE
OF
AMPUTATION OF THE THIGH
AT ITS UPPER FOURTH,
IN WHICH
ACUPRESSURE
WAS SUCCESSFULLY EMPLOYED;
WITH REMARKS.

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ANOTHER CASE

OF

ACUPRESSURE IN AMPUTATION.

A. A. M., aged forty-one years, of strumous habit, temperate, a native of Edinburgh, received, in 1839, while at Leeds, and leading a wandering life, a severe burn along the right thigh, knee, and leg, from a mass of live cinders that fell on him while he, being exhausted, lay asleep before the fire. He was taken to the Leeds Infirmary, where he remained for four months and a half; at the end of which time there existed an extensive and obstinate ulceration, for which he was transferred by the parochial authorities to Edinburgh, and remained under treatment in the Royal Infirmary for five weeks. He then left the house with the burnt surface partially cicatrized. Thereupon the ulceration opened anew; and, in July 1840, he returned to the Infirmary, and came under my care; when, in addition to treatment for an ophthalmic affection, he had his limb attended to, which, he states, cicatrized before he left the house. A. A. M. afterwards went to Sheffield, where, for an eruptive complaint, he took eighteen blue pills, by which he was profusely salivated. So powerfully was his system affected by this medicine, that mercurial tremours, attended with paralysis of the bladder, supervened. Subsequently the ulceration broke out afresh. After this he wandered to London, and lay in St Bartholomew's under treatment for a spreading ulceration of the old cicatrized surface. Thence he was returned to Scotland, as formerly; and, in April last, during fourteen days, lay again in the Infirmary here, but without improving in his condition; and before leaving that institution, although his life was in extreme peril from an excessive discharge of matter, he refused to submit to amputation of the limb.

When asked in May 1861, by Dr M'Cowan, to visit A. A. M., I found him emaciated, debilitated, and labouring under exhausting irritative fever, with extremely feeble intermitting pulse of about 160 per minute. But as he was apparently free from organic disease—an opinion in which I was confirmed by Professor Simpson—and as the sufferer was anxious for me to remove his limb, I placed him under preparatory treatment for the operation. During this time the greatest obstacle encountered in the way of progress, notwithstanding the large and lofty apartment occupied singly by the patient, was the putrid emanations that arose from the profuse discharge, mixed with blood, issuing from the ulcerated surfaces, as well as from abscesses in the popliteal cavity, which it had become necessary to open freely. A plentiful use, however, of Condyl's patent fluid proved of the greatest service in deodorizing the vitiated air of the room and lobby.

Accordingly, A. A. M. rallied somewhat from a state of extreme prostration, and now presented the symptoms of pure hectic only.

His pulse had fallen to about 130, though it was still feeble and intermitting.

On *June 22d, at noon*, I removed the limb in the presence, and favoured with the assistance, of Professor Simpson, Drs M'Cowan, Oliver of Prestonpans, Alexander Simpson, and Mr Edwards. The method of amputation by rectangular flaps, as advocated by Mr Teale of Leeds, I partially followed, adopting certain of the modifications recommended by Mr Spence.¹ In order to avoid the marginal cicatrices of the burn, I had to remove the limb at its upper third, and had to select an antero-internal very short flap, including not more than a third of the circumference of the thigh, and a postero-external flap about three times the length, and at its base twice the breadth of the other. The former flap was made by transfixing the limb, grazing the inner margin of the bone, as in the ordinary double-flap amputation, and carrying the knife in the gentlest curve downwards and inwards; while the latter, or long flap, was made by dividing in a curve first the skin only, and after retraction of it to the extent of more than an inch, I then directed the knife's point upwards to the bone, revolving it round which—after Alanson's mode²—I divided the remaining two-thirds of the fleshy parts of the thigh, forming them into a hollow cone, so as to avoid redundancy of muscle. Before applying the saw, both flaps were farther retracted, and the bone was divided not far below the *trochanters*.

The principal vessels thus lay on the internal flap. The means used to arrest the bleeding were seven short well-tempered needles, (four of No. 4, women's size, and three of No. 4, men's); to each of which was attached, for its subsequent withdrawal, fine iron wire, according to the method introduced into practice by Professor Simpson.³ The unimportant vessels were submitted, as usual, to torsion.

Twelve points of wire suture, deeply inserted, served next to retain the flaps in contact. At this stage of the operation, the effects of the chloroform wearing off, the artery of the sciatic nerve—which, just before the flaps were brought together, had been shortened about two inches—bled freely; and to avoid the removal of the stitches, a needle 5 inches long, flattened towards its point, was—at Dr Simpson's suggestion—brought down between this nerve and the *os femoris* through the skin of the region of the hip, and made to emerge at $5\frac{1}{2}$ inches peripheral distance from its point of entrance. The effect of this acupressure was instantaneously seen in the bleeding being arrested.

The patient bore the operation well, having been supported with wine at intervals. Very little blood was lost. On removal to his bed, the stump was supported by a pillow and a sling, wetted lint

¹ Edinburgh Medical Journal, Nov. 1859, Case III.

² Practical Observations on Amputation. By Edward Alanson, Surgeon to the Liverpool Infirmary. Second edition, London, 1782, p. 53.

³ See references in my former paper on this subject in the Edinburgh Medical Journal, vol. vi., p. 510.

was applied over its extremity, and an opiate with whisky was given. At 2 P.M. he suffered from thirst, exhaustion, and irritability, but was cheerful. The opiate in whisky was then repeated. At 8 P.M. his pulse, still intermitting and feeble, had however fallen to about 120. Another opiate in whisky was then given.

June 23d. The patient is feverish and depressed, and complains of great pain in the back; pulse less intermittent. Has had tea and toast. The long needle was removed from under the sciatic nerve *at the twenty-fifth hour* after the operation, without trace of bleeding. The pain in the back becoming more severe towards night, a strengthening plaster was at the patient's own request applied, and the opiate in whisky repeated.

June 24th (forty-ninth hour). Pain in the back relieved; pulse only slightly intermittent; and patient looks better. I withdrew five of the short needles from their corresponding smaller arteries, by simple traction of their connecting wires. On endeavouring likewise to remove the needles from the *femoral* and *profunda*, I found that I had inadvertently allowed their connecting wires to become mutually entangled, so that no farther traction was made at that time. No trace of bleeding followed these manipulations. A. A. M. has partaken of light food, but is dyspeptic. Towards evening the margins of the flaps had assumed an unhealthy aspect, and I therefore removed some of the stitches, and applied the tincture of myrrh. At this time I recollected that, in burying the point of the needle that occluded the *femoral* artery, I had made its point emerge for a moment through the skin. Making firm pressure, therefore, around that point of skin, I now succeeded in causing the needle's point again to protrude; on seizing which with the forceps, I extracted the needle entire, and with the scissors liberated it from its connecting wire. In a day or two after, I withdrew the needle from the *profunda*, by firm traction of the two entangled wires. In neither case did any bleeding follow, except what was evidently traceable to scratching of the granulations by the entangled bit of wire. The patient had at bedtime his opiate and whisky as usual.

25th. The stump yielded a slight discharge of pus. A lotion of zinc was now used; and wine was given occasionally, together with an opiate in whisky and water, after the forenoon and evening dressings. *26th.* The patient is weak, with a returning severe pain in his back. For this at his own request a fresh strengthening plaster was prescribed. Wine is to be given thrice a-day, and animal diet. *28th.* He takes his food well; his pulse is about 90; and he feels easier. *29th.* Discharge lessening. Has his steak and wine, besides his opiate and whisky and water twice a-day as usual, as his irritability is great. Pulse to-day is 140. *30th.* Less discharge. Pulse 120. *July 1st.* The last of the stitches was this day removed. The purulent discharge is healthy. The tongue is dry. The pulse is limping and 125. Had ʒiij of wine during the dressing of the stump. He complains of cough, for which a liniment

and mixture were prescribed. *2d.* Less cough. Pulse 110. *3d.* Pulse 108. Continues the opiate and spirits twice daily after the dressings. *4th.* Is much better. To have quinine and sulphuric acid. Pulse 120. *5th.* Pulse 115. *6th.* Pulse 110. Takes his food well, and asks for porter instead of wine. *7th.* Pulse 115. Takes his tonic and cough-mixture thrice, and his opiate twice, daily. *8th.* Pulse 117. *9th.* Pulse 115. *10th.* Pulse 112. *11th.* Sleeps well. Has full diet, for which his appetite is good. Pulse 115. *20th.* The face of the stump is contracting. Discontinue the quinine and acid, and use the sesquinitrate of iron externally and internally. Continue the opiate at bedtime only.

From this date the health of the patient and the appearance of his stump greatly improved. His pulse varied from 80 to 70, and gradually became less intermittent. His appetite continued good, his bowels regular, and his cough left him. *Aug. 20th.* On visiting A. A. M., I found his pulse 72, and regular. His stump and entire body are become stout. During the entire progress of this case I received very efficient assistance from the Messrs Millar, Black, and Vartan, pupils, who furnished me with notes of the case. *Oct. 31st.* To-day I made a cast of the stump.¹ *Jan. 8, 1862.* A. A. M. is robust and well. His pulse remains at 72, and is natural.

REMARKS.—*1st,* From the condition of the skin, this amputation could not have been performed lower down the limb.

2d, The patient was indebted for his recovery from the shock mainly to the large doses of opium, and to the free use of stimulants. He was largely benefited, too, by the internal as well as the external use of the sesquinitrate of iron. He has regained sound health, and possesses an excellent stump.

3d, From its contributing favourably towards our surgical statistics, I feel warranted in asking the attention of the profession to this narrative. The results of 300 cases of amputation at Guy's Hospital, as recorded by Mr Bryant in vol. xlii. of the Transactions of the Royal Medico-Chirurgical Society, p. 70, show, under the head of *Pathological Amputations* (or amputations from necessity) *through the thigh*, a fatal result in 18 out of 100 cases, or 18 per cent., or 1 case in 5.5. Farther, by reference to Mr Bryant's tables, it will be seen that out of 39 cases of *pathological amputations through the leg*, 3 only were fatal, or 7.7 per cent., or 1 case in 13. And, as a whole, of these amputations through the *thigh* and *leg* taken together, 15 per cent. proved fatal.

4th, Recovery in the foregoing case, that of a man above forty, of very feeble habit, much shattered by long years' purulent discharge, and deficiency of food and clothing, and so weak that a mere puff of wind seemed enough to blow him over, may perhaps be connected with the small loss of blood sustained during the operation. This seemed to be due, in part, to the greater expedition with which I was enabled to close the bleeding vessels *by*

¹ Now in the Museum of the Royal College of Surgeons, Edinburgh.

acupressure; a process easily performed by the operator alone, without the aid of an assistant.

5th, Experience now enables me to express a decided preference for *short* over *long* needles.¹ By the use of the former, I have found it as easy as by the use of the latter to command the flow of blood from the large as well as from the smaller arteries.² Transfixion of the skin is thus avoided—a material point in dealing with a texture weak in its action, and farther weakened by contact with the knife. The accidental entanglement in my hands, unperceived, of two of the wire threads in the foregoing case, shows, however, that some care in manipulation is necessary. No blame can be attached to *acupressure*, as such, if it be only properly applied.

6th, Another testimony is here afforded to the success of *acupressure* in closing summarily, within a few hours, the large vessels divided in amputations of the extremities. So far as I am aware, no instance of failure in closing an artery, by the use of the long or the short needle, has yet occurred; nor has secondary hæmorrhage taken place under this mode of procedure.

This observation, if correct, contrasts favourably with our current surgical practice. Indeed, the liability to secondary hæmorrhage that attends the use of the ligature on a wounded artery is well expressed by Professor Syme³ as follows:—"If a ligature has been applied, the ulceration by which it is separated, if too rapid or extensive, may cause a bleeding from three days to as many weeks after the infliction of the injury." After another remark, he continues thus:—"It has been proposed to obviate the immediately

¹ The application of short instead of long needles in *acupressure* is described by Dr Simpson as follows, in the *Medical Times* for April 21, 1860:—"Arteries as large even as the femoral, exposed in operations and wounds, can be effectually and easily secured by common short sewing-needles introduced from *the surface of the wound*. The needle is dipped down into the soft tissue on one side of the artery which it is desired to close, then raised up and bridged over the artery itself, and subsequently pressed downwards and onwards into the soft tissue beyond. A slender iron or silk thread passed through the eye of the needle, and left out between the lips of the wound, serves as a simple means of withdrawing the needle itself as soon as the artery is sufficiently occluded."

A more recent method of exerting *acupressure* on an artery is described by Dr Simpson in the *Transactions of the Medico-Chirurgical Society of Edinburgh*, as follows:—"In the last case of amputation at which he had been present he had adopted a new procedure. He introduced a small needle, threaded with iron-wire, behind the artery, and then throwing the noose of a duplicature of another iron thread over the point of the needle, he carried this double thread across the mouth or site of the bleeding vessel, gave it one twist below the eye-end of the needle, and thus compressed the artery easily and speedily to any required extent. It was a kind of 'temporary ligature,' to use the language of surgeons, removable in a minute, hour, or day, by drawing out the needle by traction at the thread passed through its eye."—See *Edinburgh Monthly Journal*, vol. vii. p. 788.

² See a comparative observation by me on this point in the *Transactions of the Medico-Chirurgical Society of Edinburgh*, published in the *Edinburgh Medical Journal*, vol. vi. p. 571.

³ See the paragraph ("Secondary Hæmorrhage") in the second section ("Wounds of Arteries") of the seventh chapter of his *Principles of Surgery*, second edition, p. 81.

fatal effect of excessive hæmorrhage by transfusing the blood of another individual into the veins of the patient."

7th, The cases of amputation generally, in which acupressure has been employed, range, I am informed, from thirty to forty in number; of which I hope soon to be able to present a summary that may prepare the way perhaps for a cautious induction. These include at least six cases of amputation through the thigh.¹

8th, It is interesting to observe, *first*, how very slight is the amount of acupressure that is necessary² in order to close a bleeding vessel; *secondly*, for how short a time pressure need be maintained³ in order to produce that effect; and, *thirdly*, how acupressure has not been productive hitherto of any unpleasant symptom, or even of any appreciable effect on the adjacent veins or nerves.

In applying acupressure is there no risk of producing injurious pressure on adjoining parts?—is a question that has been asked. In the foregoing narrative it was stated that the artery of the sciatic nerve had been directly compressed; now here was sufficient compression to arrest hæmorrhage from the centre probably of the nerve, and yet no injurious pressure was exerted upon the delicate nerve tissue. The patient has remained indeed to this day free from any such symptom. But it has been suggested that the great pain in the back that was felt on the day after the operation was due probably to compression of the great sciatic nerve by the long needle employed to control its central artery. It seems clear, however, that this lumbar pain experienced by the patient after the operation depended simply on cold and exposure on the operating table (or, as he himself expressed it, "to cold and the hard bed on which he lay on his back"); for, while removal of the long needle did not lessen the pain he endured, which became more severe towards night, and was relieved once and again by the use of a common strengthening plaster, applied at his own suggestion (a remedy which, while resident at Sunderland, he had had recourse to for cold), it gradually disappeared from his feeble and exhausted habit under a freer use of wine, an animal diet, and a tonic draught.

¹ See a notice of five of these cases in the Journal of Pract. Med. for Nov. 1860, English edition, p. 481.

² See Professor Simpson's remarks on this subject in the Edin. Med. Journal for Jan. 1860, p. 645; the Dubl. Hosp. Gaz. for Jan. 2, 1860, p. 7; and the Med. Times and Gaz. for Feb. 11, 1860, p. 137.

³ Illustrative of this remark is the following extract from Malgaigne's Man. de Méd. Operat., 6th edit., Paris, 1853, p. 41:—"Procédé de Koch.—Après toutes les amputations, l'opérateur ramène le lambeau sur la plaie, et le maintient par les bandelettes agglutinatives. Une compresse longuette est fixée sur le trajet de l'artère, à l'aide d'une simple bande. On donne au moignon une position un peu élevée, et un aide exerce avec la main sur le moignon une douce pression continue pendant une ou deux heures, et même aussi longtemps qu'on y ressent des pulsations considérables. Quand elles ont cessé, et que l'appareil est teint en rouge par la lymphe qui a suinté, Koch assure que tout danger d'hémorrhagie consécutive a disparu, pourvu que le malade reste tranquille. De semblables promesses n'étaient pas de nature à séduire beaucoup les chirurgiens, et ce procédé est justement abandonné."